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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/584,738	06/26/2006	Yoshikazu Kakura	19987	8170

23389 7590 02/07/2011

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SUITE 300
GARDEN CITY, NY 11530

EXAMINER	
FLORES, LEON	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
02/07/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/584,738	KAKURA, YOSHIKAZU	
	Examiner	Art Unit	
	LEON FLORES	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 January 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,10-17,22-27 and 34-37* is/are rejected.

7)☒ Claim(s) *6-9,18-21 and 30-33* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims (1-37) have been considered but are moot in view of the new ground(s) of rejection.

Applicant asserts that *"Takada also teaches that different transmitters use different hopping patterns. However, Takada does not teach that each antenna uses different hopping patterns. Notably, Takada does not suggest (at col 1, lines 63-66) that the correspondence is different for each of the plurality of transmission antennas, where each transmission signal output has a different correspondence. In fact, there is no teaching or suggestion that the transmitter is even capable of using multiple different frequency hopping patterns for multiple antennas (the reference is also silent on the number of antennas in the transmitter). Therefore, Takada fails to cure the underlying deficiencies with the primary reference; the teaching is merely cumulative".*

The examiner respectfully disagrees. **MPEP 2145 III** states:
"The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference.... Rather, the test is what the combined teachings of those references would have suggested to those of ordinary skill in the art." In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). See also In re Sneed, 710 F.2d 1544, 1550, 218 USPQ 385, 389 (Fed. Cir. 1983) ("[I]t is not necessary that the inventions of the references be physically combinable to render obvious the invention under review."); and In re Nievelt, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973) ("Combining the teachings of references does not involve an ability to

combine their specific structures.")". Having said this, the reference of Takada does teach that in a Frequency Hopping Spread System (FHSS), interference between signals transmitted by different transmitters using different hopping patterns is unlikely to cause a problem b/c the probability of the same frequency being used at the same time is low wherein suggesting that each of the transmitter being used to transmit information via an antenna has a different correspondence (hopping pattern). It is well known in the art that a transmitter is comprised of an antenna in order to transmit information.

Applicant further asserts that *"the correspondence is between first through K-th (K being an integer not smaller than 2) transmission sequences and frequency channels. Hottinen teaches that the same signal is transmitted by using different channels to obtain a diversity gain. Specifically, Hottinen teaches that the same symbol is transmitted by using different frequencies or different codes. See Figs. 2, 3 and ¶0041 and 0089. Notably, ¶0093 states that "[b]y means of the transmitter of the invention, a signal 320 is transmitted by using three or more antennas" (emphasis added). In contrast, in the claimed invention correspondence between the first through K-th transmission sequences and the frequency channels is different for each of the plurality of transmission antennas of the same wireless communication apparatus".*

The examiner respectfully disagrees. **MPEP 2145 states:**

"Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993)".

Although applicant does teach first through K-th (K being an integer not smaller than 2) transmission sequences and frequency channels, it does explicitly teach that the sequences are different.

However, taking the contrary, applicant is silent in regards to the rejection made over AAPA in view of Partyka (See page 16 final office action dated 10/25/2010) The reference of Partyka discloses a plurality of transmitters that transmit messages at varying frequencies wherein the frequency and time intervals are varied according to patterns that can be determined individually for each transmitter.

Again, **MPEP 2145 III** states:

"The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference.... Rather, the test is what the combined teachings of those references would have suggested to those of ordinary skill in the art." In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). See also In re Sneed, 710 F.2d 1544, 1550, 218 USPQ 385, 389 (Fed. Cir. 1983) ("[I]t is not necessary that the inventions of the references be physically combinable to render obvious the invention under review."); and In re Nievelt, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973) ("Combining the teachings of references does not involve an ability to combine their specific structures.")".

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. **Claims (1-3, 10-15, 22-27, 34-37) are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (hereinafter AAPA) in view of Takada. (US Patent 7,031,402 B2)**

Re claim 1, AAPA discloses a wireless communication system using a wireless communication apparatus having a plurality of transmission and reception antennas, wherein: the wireless communication apparatus comprising: correspondence determining means for determining, upon producing first through M-th (M being an integer not smaller than 2) transmission signals, correspondence between first through K-th (K being an integer not smaller than 2) transmission sequences and frequency channels (See fig. 4: 86); and extracting and combining means for extracting and combining, upon producing first through K-th demodulated sequences, M demodulated

signals corresponding to the first through the K-th transmission sequences in accordance with the correspondence between the first through the K-th transmission sequences and the frequency channels. (See fig. 5: 108, 110 & ¶s 18-19)

But the reference of AAPA fails to explicitly teach that the correspondence is different for each of said plurality of transmission antennas, where each transmission signal output has a different correspondence.

However, Takada does. (See col. 1, lines 63-66) Takada suggests that the correspondence is different for each of said plurality of transmission antennas, where each transmission signal output has a different correspondence. ("In a Frequency Hopping Spread Spectrum (FHSS) system, interference between signals transmitted by different transmitters using different hopping patterns is unlikely to cause a problem b/c the probability of the same frequency being used at the same time is low".)

Therefore, taking the combined teaching of AAPA and Takada as a whole, it would have been obvious to one of ordinary skills in the art to incorporate this feature into the system of Yoshii, in the manner as claimed and as taught by Takada, for the benefit of minimizing interference between transmitters.

Re claim 2, the combination of AAPA & Takada further teach that wherein: the correspondence determining means comprises: a transmitting portion including coded sequence producing means for encoding first through K-th transmission sequences to produce first through K-th coded sequences, respectively (In AAPA, see fig. 4: 81), interleaved sequence producing means for interleaving the first through the K-th coded

sequences to produce first through K-th interleaved sequences, respectively (In AAPA, see fig. 4: 82), partial transmission sequence producing means for dividing each of the first through the K-th interleaved sequences into first through M-th partial transmission sequences (In AAPA, see fig. 4: 83), transmission signal producing means for frequency-multiplexing the first through the M-th partial transmission sequences corresponding to each of the first through the K-th transmission sequences with respect to each of the first through the M-th partial transmission sequences to produce first through M-th transmission signals, and first through M-th transmission antennas for transmitting the first through the M-th transmission signals, respectively. (In AAPA, see fig. 4: 93-94)

Re claim 3, the combination of AAPA & Takada further teach that wherein: the extracting and combining means comprises a receiving portion including first through N-th (N being an integer not smaller than 1) reception antennas (In AAPA, see fig. 5: 10), demodulating means for decomposing first through N-th reception signals received by the first through the N-th reception antennas into first through M-th partial demodulated signals for each frequency channel (In AAPA, see fig. 5: 110), demodulated sequence producing means for extracting and combining, from the first through the M-th partial demodulated signals for each frequency channel, M demodulated signals corresponding to each of the first through the K-th transmission sequences to thereby produce first through K-th demodulated sequences (In AAPA, see fig. 5: 110), deinterleaved sequence producing means for deinterleaving the first through the K-th demodulated

sequences to produce first through K-th deinterleaved sequences, respectively (In AAPA, see fig. 5: 112), and decoding means for decoding the first through the K-th deinterleaved sequences to produce first through K-th decoded sequences, respectively. (In AAPA, see fig. 5: 113)

Re claim 10, the combination of AAPA & Takada further teach that wherein OFDM (Orthogonal Frequency Division Multiplex) is used as a wireless transmission method and frequency multiplexing is realized by multiplexing subcarriers. (In AAPA, see fig. 4 & ¶ 13)

Re claim 11, the combination of AAPA & Takada further teach that wherein: the transmission signal producing means determines, upon producing the first through the M-th transmission signals, correspondence between the first through the K-th transmission sequences and the frequency channels by the use of a different frequency hopping pattern for each transmission signal (In AAPA, see fig. 4: 86); the demodulated sequence producing means extracting and combining, upon producing the first through the K-th demodulated sequences, M demodulated signals corresponding to each of the first through the K-th transmission sequences in accordance with the different hopping pattern for each transmission signal in the transmission signal producing means. (In AAPA, see fig. 5: 107)

Re claim 12, the combination of AAPA & Takada further teach that wherein a frequency hopping pattern such that frequency channels corresponding to an i-th (i=1, 2, . . . , K) transmission sequence are completely orthogonal among the first through the M-th transmission signals. (In AAPA, see fig. 4: 86)

Claim 13 has been analyzed and rejected w/r to claim 1 above.

Claim 14 has been analyzed and rejected w/r to claim 2 above.

Claim 15 has been analyzed and rejected w/r to claim 3 above.

Claim 22 has been analyzed and rejected w/r to claim 10 above.

Claim 23 has been analyzed and rejected w/r to claim 11 above.

Claim 24 has been analyzed and rejected w/r to claim 12 above.

Claim 25 is a method claim corresponding to system claim 1. Hence, the steps performed in method claim 25 would have necessitated the elements in system claim 1. Therefore, claim 25 has been analyzed and rejected w/r to claim 1 above.

Claim 26 is a method claim corresponding to system claim 2. Hence, the steps performed in method claim 26 would have necessitated the elements in system claim 2. Therefore, claim 26 has been analyzed and rejected w/r to claim 2 above.

Claim 27 is a method claim corresponding to system claim 3. Hence, the steps performed in method claim 27 would have necessitated the elements in system claim 3. Therefore, claim 27 has been analyzed and rejected w/r to claim 3 above.

Claim 34 is a method claim corresponding to system claim 10. Hence, the steps performed in method claim 34 would have necessitated the elements in system claim 10. Therefore, claim 34 has been analyzed and rejected w/r to claim 10 above.

Claim 35 is a method claim corresponding to system claim 11. Hence, the steps performed in method claim 35 would have necessitated the elements in system claim 11. Therefore, claim 35 has been analyzed and rejected w/r to claim 11 above.

Claim 36 is a method claim corresponding to system claim 12. Hence, the steps performed in method claim 36 would have necessitated the elements in system claim 12. Therefore, claim 36 has been analyzed and rejected w/r to claim 12 above.

Claim 37 has been analyzed and rejected w/r to claim 1 above.

5. **Claims (4-5, 16-17, 28-29) are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (hereinafter AAPA) & Takada (US Patent 7,031,402 B2), as applied to claims 1, 13, 25 & 37 above, and further in view of Ue et al. (hereinafter Ue) (US Patent 6,611,676 B2)**

Re claim 4, the combination of AAPA & Takada fails to teach that wherein the transmitting portion comprises scheduling means for reducing the number of transmission sequences when a reception quality at the receiving portion is lower than a predetermined first threshold and for increasing the number of transmission sequences when the reception quality is higher than a predetermined second threshold.

However, Ue does. (See figs. 1-2) Ue discloses that wherein the transmitting portion comprises scheduling means for reducing the number of transmission sequences when a reception quality at the receiving portion is lower than a predetermined first threshold (See col. 7, lines 4-8) and for increasing the number of transmission sequences when the reception quality is higher than a predetermined second threshold. (See col. 7, lines 30-35)

Therefore, taking the combined teaching of AAPA, Takada & Ue as a whole, it would have been obvious to one of ordinary skills in the art to incorporate this feature into the system of AAPA, as modified by Takada, in the manner as claimed and as taught by Ue, for the benefit of enhancing the effect of switching the transmission rate. (See col. 7, lines 24-25)

Re claim 5, the combination of AAPA, Takada & Ue further teach that wherein the scheduling means reduces the number of transmission sequences successively from the transmission sequence for which the reception quality at the receiving portion for each transmission sequence is low. (In Ue, see col. 7, lines 4-8)

Claims (16-17) have been analyzed and rejected w/r to claims (4-5), respectively.

Claim 28 is a method claim corresponding to system claim 4. Hence, the steps performed in method claim 28 would have necessitated the elements in system claim 4. Therefore, claim 28 has been analyzed and rejected w/r to claim 4 above.

Claim 29 is a method claim corresponding to system claim 5. Hence, the steps performed in method claim 29 would have necessitated the elements in system claim 5. Therefore, claim 29 has been analyzed and rejected w/r to claim 5 above.

6. **Claims (1-3, 10-15, 22-27, 34-37) are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (hereinafter AAPA) in view of Hottinen et al. (hereinafter Hottinen) (US Publication 2003/0081563 A1)**

Re claim 1, AAPA discloses a wireless communication system using a wireless communication apparatus having a plurality of transmission and reception antennas, wherein: the wireless communication apparatus comprising: correspondence determining means for determining, upon producing first through M-th (M being an

integer not smaller than 2) transmission signals, correspondence between first through K-th (K being an integer not smaller than 2) transmission sequences and frequency channels (See fig. 4: 86); and extracting and combining means for extracting and combining, upon producing first through K-th demodulated sequences, M demodulated signals corresponding to the first through the K-th transmission sequences in accordance with the correspondence between the first through the K-th transmission sequences and the frequency channels. (See fig. 5: 108, 110 & ¶s 18-19)

But the reference of AAPA fails to explicitly teach that the correspondence is different for each of said plurality of transmission antennas, where each transmission signal output has a different correspondence.

However, Hottinen does. (See figs. 2-3 & ¶s 41, 89) Hottinen suggests that the correspondence is different for each of said plurality of transmission antennas, where each transmission signal output has a different correspondence. ("at different frequencies or different spreading codes")

Therefore, taking the combined teaching of AAPA and Hottinen as a whole, it would have been obvious to one of ordinary skills in the art to incorporate this feature into the system of AAPA, in the manner as claimed and as taught by Hottinen, for the benefit of minimizing interference between transmitters.

Re claim 2, the combination of AAPA and Hottinen further teach that wherein: the correspondence determining means comprises: a transmitting portion including coded sequence producing means for encoding first through K-th transmission sequences to

produce first through K-th coded sequences, respectively (In AAPA, see fig. 4: 81), interleaved sequence producing means for interleaving the first through the K-th coded sequences to produce first through K-th interleaved sequences, respectively (In AAPA, see fig. 4: 82), partial transmission sequence producing means for dividing each of the first through the K-th interleaved sequences into first through M-th partial transmission sequences (In AAPA, see fig. 4: 83), transmission signal producing means for frequency-multiplexing the first through the M-th partial transmission sequences corresponding to each of the first through the K-th transmission sequences with respect to each of the first through the M-th partial transmission sequences to produce first through M-th transmission signals, and first through M-th transmission antennas for transmitting the first through the M-th transmission signals, respectively. (In AAPA, see fig. 4: 93-94)

Re claim 3, the combination of AAPA and Hottinen further teach that wherein:the extracting and combining means comprises a receiving portion including first through N-th (N being an integer not smaller than 1) reception antennas (In AAPA, see fig. 5: 10), demodulating means for decomposing first through N-th reception signals received by the first through the N-th reception antennas into first through M-th partial demodulated signals for each frequency channel (In AAPA, see fig. 5: 110), demodulated sequence producing means for extracting and combining, from the first through the M-th partial demodulated signals for each frequency channel, M demodulated signals corresponding to each of the first through the K-th transmission sequences to thereby produce first

through K-th demodulated sequences (In AAPA, see fig. 5: 110), deinterleaved sequence producing means for deinterleaving the first through the K-th demodulated sequences to produce first through K-th deinterleaved sequences, respectively (In AAPA, see fig. 5: 112), and decoding means for decoding the first through the K-th deinterleaved sequences to produce first through K-th decoded sequences, respectively. (In AAPA, see fig. 5: 113)

Re claim 10, the combination of AAPA and Hottinen further teach that wherein OFDM (Orthogonal Frequency Division Multiplex) is used as a wireless transmission method and frequency multiplexing is realized by multiplexing subcarriers. (In AAPA, see fig. 4 & ¶ 13)

Re claim 11, the combination of AAPA and Hottinen further teach that wherein: the transmission signal producing means determines, upon producing the first through the M-th transmission signals, correspondence between the first through the K-th transmission sequences and the frequency channels by the use of a different frequency hopping pattern for each transmission signal (In AAPA, see fig. 4: 86); the demodulated sequence producing means extracting and combining, upon producing the first through the K-th demodulated sequences, M demodulated signals corresponding to each of the first through the K-th transmission sequences in accordance with the different hopping pattern for each transmission signal in the transmission signal producing means. (In

AAPA, see fig. 5: 107)

Re claim 12, the combination of AAPA and Hottinen further teach that wherein a frequency hopping pattern such that frequency channels corresponding to an i-th (i=1, 2, . . . , K) transmission sequence are completely orthogonal among the first through the M-th transmission signals. (In AAPA, see fig. 4: 86)

Claim 13 has been analyzed and rejected w/r to claim 1 above.

Claim 14 has been analyzed and rejected w/r to claim 2 above.

Claim 15 has been analyzed and rejected w/r to claim 3 above.

Claim 22 has been analyzed and rejected w/r to claim 10 above.

Claim 23 has been analyzed and rejected w/r to claim 11 above.

Claim 24 has been analyzed and rejected w/r to claim 12 above.

Claim 25 is a method claim corresponding to system claim 1. Hence, the steps performed in method claim 25 would have necessitated the elements in system claim 1. Therefore, claim 25 has been analyzed and rejected w/r to claim 1 above.

Claim 26 is a method claim corresponding to system claim 2. Hence, the steps performed in method claim 26 would have necessitated the elements in system claim 2. Therefore, claim 26 has been analyzed and rejected w/r to claim 2 above.

Claim 27 is a method claim corresponding to system claim 3. Hence, the steps performed in method claim 27 would have necessitated the elements in system claim 3. Therefore, claim 27 has been analyzed and rejected w/r to claim 3 above.

Claim 34 is a method claim corresponding to system claim 10. Hence, the steps performed in method claim 34 would have necessitated the elements in system claim 10. Therefore, claim 34 has been analyzed and rejected w/r to claim 10 above.

Claim 35 is a method claim corresponding to system claim 11. Hence, the steps performed in method claim 35 would have necessitated the elements in system claim 11. Therefore, claim 35 has been analyzed and rejected w/r to claim 11 above.

Claim 36 is a method claim corresponding to system claim 12. Hence, the steps performed in method claim 36 would have necessitated the elements in system claim 12. Therefore, claim 36 has been analyzed and rejected w/r to claim 12 above.

Claim 37 has been analyzed and rejected w/r to claim 1 above.

7. **Claims (4-5, 16-17, 28-29) are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (hereinafter AAPA) & Hottinen et al (hereinafter Hottinen) (US Publication 2003/0081563 A1), as applied to claims 1, 13, 25 & 37 above, and further in view of Ue et al. (hereinafter Ue) (US Patent 6,611,676 B2)**

Re claim 4, the combination of AAPA & Hottinen fails to teach that wherein the transmitting portion comprises scheduling means for reducing the number of transmission sequences when a reception quality at the receiving portion is lower than a predetermined first threshold and for increasing the number of transmission sequences when the reception quality is higher than a predetermined second threshold.

However, Ue does. (See figs. 1-2) Ue discloses that wherein the transmitting portion comprises scheduling means for reducing the number of transmission sequences when a reception quality at the receiving portion is lower than a predetermined first threshold (See col. 7, lines 4-8) and for increasing the number of transmission sequences when the reception quality is higher than a predetermined second threshold. (See col. 7, lines 30-35)

Therefore, taking the combined teaching of AAPA, Hottinen & Ue as a whole, it would have been obvious to one of ordinary skills in the art to incorporate this feature into the system of AAPA, as modified by Hottinen, in the manner as claimed and as taught by Ue, for the benefit of enhancing the effect of switching the transmission rate. (See col. 7, lines 24-25)

Re claim 5, the combination of AAPA, Hottinen & Ue further teach that wherein the scheduling means reduces the number of transmission sequences successively from the transmission sequence for which the reception quality at the receiving portion for each transmission sequence is low. (In Ue, see col. 7, lines 4-8)

Claims (16-17) have been analyzed and rejected w/r to claims (4-5), respectively.

Claim 28 is a method claim corresponding to system claim 4. Hence, the steps performed in method claim 28 would have necessitated the elements in system claim 4. Therefore, claim 28 has been analyzed and rejected w/r to claim 4 above.

Claim 29 is a method claim corresponding to system claim 5. Hence, the steps performed in method claim 29 would have necessitated the elements in system claim 5. Therefore, claim 29 has been analyzed and rejected w/r to claim 5 above.

8. **Claims (1-3, 10-15, 22-27, 34-37) are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (hereinafter AAPA) in view of Partyka. (US Patent 6,728,293 B1)**

Re claim 1, AAPA discloses a wireless communication system using a wireless communication apparatus having a plurality of transmission and reception antennas, wherein: the wireless communication apparatus comprising: correspondence determining means for determining, upon producing first through M-th (M being an

integer not smaller than 2) transmission signals, correspondence between first through K-th (K being an integer not smaller than 2) transmission sequences and frequency channels (See fig. 4: 86); and extracting and combining means for extracting and combining, upon producing first through K-th demodulated sequences, M demodulated signals corresponding to the first through the K-th transmission sequences in accordance with the correspondence between the first through the K-th transmission sequences and the frequency channels. (See fig. 5: 108, 110 & ¶s 18-19)

But the reference of AAPA fails to explicitly teach that the correspondence is different for each of said plurality of transmission antennas, where each transmission signal output has a different correspondence.

However, Partyka does. (See Abstract & claim 10) Partyka suggests that the correspondence is different for each of said plurality of transmission antennas, where each transmission signal output has a different correspondence. ("hopping pattern is different for each of the transmitters")

Therefore, taking the combined teaching of AAPA and Partyka as a whole, it would have been obvious to one of ordinary skills in the art to incorporate this feature into the system of Yoshii, in the manner as claimed and as taught by Partyka, for the benefit of minimizing interference between transmitters.

Re claim 2, the combination of AAPA & Partyka further teach that wherein: the correspondence determining means comprises: a transmitting portion including coded sequence producing means for encoding first through K-th transmission sequences to

produce first through K-th coded sequences, respectively (In AAPA, see fig. 4: 81), interleaved sequence producing means for interleaving the first through the K-th coded sequences to produce first through K-th interleaved sequences, respectively (In AAPA, see fig. 4: 82), partial transmission sequence producing means for dividing each of the first through the K-th interleaved sequences into first through M-th partial transmission sequences (In AAPA, see fig. 4: 83), transmission signal producing means for frequency-multiplexing the first through the M-th partial transmission sequences corresponding to each of the first through the K-th transmission sequences with respect to each of the first through the M-th partial transmission sequences to produce first through M-th transmission signals, and first through M-th transmission antennas for transmitting the first through the M-th transmission signals, respectively. (In AAPA, see fig. 4: 93-94)

Re claim 3, the combination of AAPA & Partyka further teach that wherein: the extracting and combining means comprises a receiving portion including first through N-th (N being an integer not smaller than 1) reception antennas (In AAPA, see fig. 5: 10), demodulating means for decomposing first through N-th reception signals received by the first through the N-th reception antennas into first through M-th partial demodulated signals for each frequency channel (In AAPA, see fig. 5: 110), demodulated sequence producing means for extracting and combining, from the first through the M-th partial demodulated signals for each frequency channel, M demodulated signals corresponding to each of the first through the K-th transmission sequences to thereby produce first

through K-th demodulated sequences (In AAPA, see fig. 5: 110), deinterleaved sequence producing means for deinterleaving the first through the K-th demodulated sequences to produce first through K-th deinterleaved sequences, respectively (In AAPA, see fig. 5: 112), and decoding means for decoding the first through the K-th deinterleaved sequences to produce first through K-th decoded sequences, respectively. (In AAPA, see fig. 5: 113)

Re claim 10, the combination of AAPA & Partyka further teach that wherein OFDM (Orthogonal Frequency Division Multiplex) is used as a wireless transmission method and frequency multiplexing is realized by multiplexing subcarriers. (In AAPA, see fig. 4 & ¶ 13)

Re claim 11, the combination of AAPA & Partyka further teach that wherein: the transmission signal producing means determines, upon producing the first through the M-th transmission signals, correspondence between the first through the K-th transmission sequences and the frequency channels by the use of a different frequency hopping pattern for each transmission signal (In AAPA, see fig. 4: 86); the demodulated sequence producing means extracting and combining, upon producing the first through the K-th demodulated sequences, M demodulated signals corresponding to each of the first through the K-th transmission sequences in accordance with the different hopping pattern for each transmission signal in the transmission signal producing means. (In

AAPA, see fig. 5: 107)

Re claim 12, the combination of AAPA & Partyka further teach that wherein a frequency hopping pattern such that frequency channels corresponding to an i-th (i=1, 2, . . . , K) transmission sequence are completely orthogonal among the first through the M-th transmission signals. (In AAPA, see fig. 4: 86)

Claim 13 has been analyzed and rejected w/r to claim 1 above.

Claim 14 has been analyzed and rejected w/r to claim 2 above.

Claim 15 has been analyzed and rejected w/r to claim 3 above.

Claim 22 has been analyzed and rejected w/r to claim 10 above.

Claim 23 has been analyzed and rejected w/r to claim 11 above.

Claim 24 has been analyzed and rejected w/r to claim 12 above.

Claim 25 is a method claim corresponding to system claim 1. Hence, the steps performed in method claim 25 would have necessitated the elements in system claim 1. Therefore, claim 25 has been analyzed and rejected w/r to claim 1 above.

Claim 26 is a method claim corresponding to system claim 2. Hence, the steps performed in method claim 26 would have necessitated the elements in system claim 2. Therefore, claim 26 has been analyzed and rejected w/r to claim 2 above.

Claim 27 is a method claim corresponding to system claim 3. Hence, the steps performed in method claim 27 would have necessitated the elements in system claim 3. Therefore, claim 27 has been analyzed and rejected w/r to claim 3 above.

Claim 34 is a method claim corresponding to system claim 10. Hence, the steps performed in method claim 34 would have necessitated the elements in system claim 10. Therefore, claim 34 has been analyzed and rejected w/r to claim 10 above.

Claim 35 is a method claim corresponding to system claim 11. Hence, the steps performed in method claim 35 would have necessitated the elements in system claim 11. Therefore, claim 35 has been analyzed and rejected w/r to claim 11 above.

Claim 36 is a method claim corresponding to system claim 12. Hence, the steps performed in method claim 36 would have necessitated the elements in system claim 12. Therefore, claim 36 has been analyzed and rejected w/r to claim 12 above.

Claim 37 has been analyzed and rejected w/r to claim 1 above.

9. **Claims (4-5, 16-17, 28-29) are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (hereinafter AAPA) & Partyka (US Patent 6,728,293 B1), as applied to claims 1, 13, 25 & 37 above, and further in view of Ue et al. (hereinafter Ue) (US Patent 6,611,676 B2)**

Re claim 4, the combination of AAPA & Partyka fails to teach that wherein the transmitting portion comprises scheduling means for reducing the number of transmission sequences when a reception quality at the receiving portion is lower than a predetermined first threshold and for increasing the number of transmission sequences when the reception quality is higher than a predetermined second threshold.

However, Ue does. (See figs. 1-2) Ue discloses that wherein the transmitting portion comprises scheduling means for reducing the number of transmission sequences when a reception quality at the receiving portion is lower than a predetermined first threshold (See col. 7, lines 4-8) and for increasing the number of transmission sequences when the reception quality is higher than a predetermined second threshold. (See col. 7, lines 30-35)

Therefore, taking the combined teaching of AAPA, Partyka & Ue as a whole, it would have been obvious to one of ordinary skills in the art to incorporate this feature into the system of AAPA, as modified by Partyka, in the manner as claimed and as taught by Ue, for the benefit of enhancing the effect of switching the transmission rate. (See col. 7, lines 24-25)

Re claim 5, the combination of AAPA, Partyka & Ue further teach that wherein the scheduling means reduces the number of transmission sequences successively from the transmission sequence for which the reception quality at the receiving portion for each transmission sequence is low. (In Ue, see col. 7, lines 4-8)

Claims (16-17) have been analyzed and rejected w/r to claims (4-5), respectively.

Claim 28 is a method claim corresponding to system claim 4. Hence, the steps performed in method claim 28 would have necessitated the elements in system claim 4. Therefore, claim 28 has been analyzed and rejected w/r to claim 4 above.

Claim 29 is a method claim corresponding to system claim 5. Hence, the steps performed in method claim 29 would have necessitated the elements in system claim 5. Therefore, claim 29 has been analyzed and rejected w/r to claim 5 above.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEON FLORES whose telephone number is (571)270-1201. The examiner can normally be reached on Mon-Fri 7-5pm Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Leon Flores/
Examiner, Art Unit 2611
February 4, 2011